National Institute of Environmental Health Sciences

Short communication: Impact of climate variability on the incidence of dengue in Mexico

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Abstract:

We evaluated the impact of weather variables and climatic indicators associated with the incidence of dengue in two municipalities of the state of Veracruz, Mexico, from 1995 to 2003. A retrospective ecological study was conducted, using time-series analysis in which we compiled the weekly reported cases of dengue and the weather and climatic parameters: temperature, rainfall and sea-surface temperature (SST), the latter as an El Nino Southern Oscillation indicator. We statistically evaluated the data with autogressive models. The models' predictive abilities were evaluated using data collected from 1995 to 2002 and were validated with those observed for 2003. Each degree Centigrade increase in SST was followed by an increase in the number of dengue cases: 46% in San andres Tuxtla (P Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.001) 16 weeks later and 42% in Veracruz 20 weeks later (P Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 0.002). Increases in weekly minimum temperature and rainfall were also significant factors in the increase in the reported cases of dengue. We recommend future studies using the same method, involving larger populations with different geographic location, climate and weather. We also recommend strengthening environmental, health and entomological surveillance systems to improve preparedness and emergency responses.

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Resource Description

Early Warning System: ☑

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☑

weather or climate related pathway by which climate change affects health

Ecosystem Changes, El Nino Southern Oscillation, Temperature

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Non-U.S. North America

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Dengue

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Short-Term (

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content